PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	10/828,420
Filing Date:	April 20, 2004
Applicant:	Scott Dewey et al.
Group Art Unit:	2829
Examiner:	Ernest F. Karlsen
Title:	HIGH VOLTAGE ISOLATION DETECTION OF A FUEL CELL SYSTEM USING MAGNETIC FIELD CANCELLATION
Attorney Docket:	GP-303953

Mail Stop Amendment
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION

This is a Response to the Office Action mailed March 7, 2007, to which a response is due by June 7, 2007. Claims 1-19 are pending in this application. Of these claims, claims 1-19 stand rejected under 35 USC §103(a) as being unpatentable over Jin in view of Powell and Kuhrt.

In view of the following remarks, this rejection is traversed, and reconsideration of this application is respectfully requested.

Applicant's claimed invention of independent claims 1, 10 and 15 is directed to detecting an isolation fault in a fuel cell system using magnetic field cancellation. Each of the independent claims includes a fuel cell stack having a positive terminal and a negative terminal, a first conductor electrically coupled to

the positive terminal and a high voltage component in the system and a second conductor electrically coupled to the negative terminal of the stack and the high voltage component. Magnetic fields generated by the currents propagating in opposite directions through the first and second conductors cancel if electrical isolation is maintained, and a magnetic field is generated and detected if an isolation fault occurs.

U.S. Patent No. 6,998,819 issued to Jin discloses a method for detecting leakage currents in a high voltage battery pack system. The Jin method attempts to eliminate errors in leakage measurements as a result of fluctuations in battery module voltages by measuring all of the module voltages simultaneously while performing the leakage measurements. (Column 4, lines 34-35). Applicant respectfully submits that Jin does not teach or suggest detecting leakage currents in a fuel cell system, and particularly a detecting system including a first conductor electrically coupled to a positive terminal of a fuel cell stack and a high voltage component and a second conductor electrically coupled to a negative terminal of the stack and the high voltage component. In other words, Jin does not teach or suggest magnetic field cancellation for detecting the leakage current, and does not teach or suggest detecting leakage currents in a fuel cell system.

U.S. Patent 5,986,444 issued to Powell discloses a device for detecting low magnitude electrical signals that includes conductors 12 extending through a toroidally-shaped member 10, where current propagates through the conductors 12 in opposite directions. A magneto-resistor bridge 16 detects magnetic fields so that if the currents are different, a magnetic field will be generated that can be detected.

Applicant respectfully submits that Powell does not teach or suggest detecting electrical isolation fault conditions in a fuel cell system. Column 2, lines 33 and 34, states that the conductors 12 "are respectively connected to the live and neutral supplies to the residual current device." There does not appear to be any other discussion in Powell of connecting the conductors 12 to a current generating device, and there clearly is no teaching or suggestion in Powell of electrically coupling one of the conductors to a positive terminal of a fuel cell stack and a high voltage component and the other conductor 12 to the negative terminal of the fuel cell stack and the high voltage component.

U.S. Patent No. 2,946,955 issued to Kuhrt discloses a current measuring device that employs a magnetic field-responsive resistor 1 for detecting current. The resistor 1 is part of a bridge circuit including resistors 3, 4 and 5, and detects a current flow through a conductor 2. Applicant submits that there is no teaching or suggestion in Kuhrt of detecting an isolation fault using magnetic field cancellation, and no teaching or suggestion of detecting an isolation fault in a fuel cell system. Therefore, Applicant submits that Kuhrt cannot provide the teaching missing from Jin or Powell to make Applicant's independent claims 1, 10 and 15 obvious.

Applicant respectfully submits that the Examiner has not established a *prima facie* case of obviousness by the combination of Jin, Powell and Kuhrt. Applicant submits that there is no teaching in Jin, Powell or Kuhrt of detecting isolation fault failures in a fuel cell system using magnetic field canceling. Jin teaches detecting current leakages in the battery back system, not a fuel cell system, and Powell only teaches detecting fault currents using magnetic field cancellation without being specific to the system that the fault current is coming

from. Therefore, Applicant respectfully submits that the Examiner has improperly combined Jin, Powell and Kuhrt to make Applicant's independent claims 1, 10 and 15 obvious.

It is therefore respectfully requested that the §103(a) rejection be withdrawn.

It is now believed that this application is in condition for allowance. If the Examiner believes that personal contact with Applicant's representative would expedite prosecution of this application, he is invited to call the undersigned at his convenience.

Respectfully submitted,

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